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A Sciuravid Rodent from the Middle Eocene of Wyoming

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Studies on rodents from the middle Eocene Bridger formation of Wyoming have revealed a previously unknown dental pattern for a sciuravid in a specimen in collections of the American Museum of Natural History. Thanks are given to Dr. Malcolm C. McKenna for permission to study this specimen and to Dr. C. Lewis Gazin of the United States National Museum for stratigraphic information.

MATERIAL: A.M.N.H. No. 12118, incomplete maxilla with P³-M¹, moderately worn; upper Bridger of Twin Buttes (C₅ of Matthew, white stratum), Bridger Basin, Wyoming.

A precise taxonomic assignment has not been made for No. 12118. Upper jaw material only is known, and this specimen might be found to belong with the lower jaw of an already named sciuravid. Table 1 shows the stratigraphic distribution and known jaws of named sciuravids from the Bridger formation, based mostly on specimens in the American Museum of Natural History, Yale Peabody Museum, and the United States National Museum. Collections of the Academy of Natural Sciences of Philadelphia, Carnegie Museum, Princeton University, and University of Wyoming also have been consulted.

Described sciuravid upper jaws, including No. 12118, are too large to be associated with *Sciuravus bridgeri* and the two species of *Pauromys*. Size and stratigraphic occurrence allow association of *Taxymys lucaris*

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with *Tillomys senex*, but this possible association has not been verified. On the basis of over-all size, No. 12118 could be associated with lower jaws of *Tillomys senex* and *Sciuravus?* *rarus*. Association with *S.?* *rarus* seems unlikely, however, owing to the distinct reduction of P_4 in that species, which seems to prohibit occlusion with No. 12118.

Reference of No. 12118 (fig. 1) to the family Sciuravidae is supported by the structure of M^1 , in which the hypocone is subequal to the protocone and is separated from the protocone lingually by a distinct valley. The outline of the first molar is roughly quadrate. Its

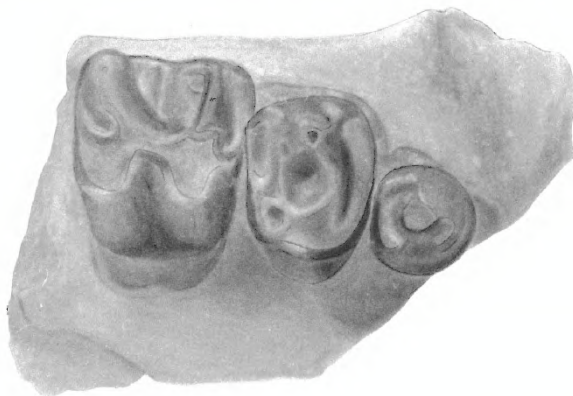


FIG. 1. A.M.N.H. No. 12118. Occlusal view of right maxilla with P^3 - M^1 . $\times 12$.

buccal wall is slightly concave. The ridged anterior cingulum is separated from the paracone and projects as a parastyle buccally. A mesostyle partially blocks the V-shaped valley between paracone and metacone. A loph extends posterolingually from the paracone to come in contact with the worn protocone. The protoconule seems to be represented by a projection from the protocone into the anterior valley. The metaloph curves anterolingually from the metacone to the anterobuccal edge of the hypocone. At this stage of wear protocone and hypocone are joined near the center of the tooth. A valley is enclosed between the metacone-metaloph and the posterior cingulum.

The premolars of No. 12118 are distinctive, causing an earlier observer of the specimen, perhaps W. D. Matthew, to write on its catalogue card, "Rodent! small P^4 , large P^3 ." The high central cusp on P^3 has a wear surface facing posteroventrally. A shelf occurs antero-medial to this cusp, and a larger shelf encircles the tooth posteriorly. The fourth premolar has a single buccal cusp, the paracone,

TABLE 1
STRATIGRAPHIC DISTRIBUTION AND KNOWN JAWS OF SCIURAVIDS
FROM THE BRIDGER FORMATION

Species	Level in Bridger ^a	Known Jaws
<i>Sciuravus nitidus</i>	Lower and upper Bridger	Upper and lower jaws associated; most abundant Bridger sciuravid
<i>S. bridgeri</i>	Lower Bridger	Lower jaws
<i>S.?</i> <i>rarus</i> ^b	Not definitely known, probably upper Bridger ^c	Lower jaw
<i>Taxymys lucaris</i>	Upper lower and upper Bridger	Upper jaws
<i>Taxymys?</i> <i>progressus</i>	Not definitely known	Upper jaw
<i>Tillomys senex</i>	Upper lower and upper Bridger	Lower jaws
<i>Tillomys?</i> <i>parvidens</i>	Probably lower Bridger ^c	Lower jaw
<i>Pauromys perditus</i>	Probably lower Bridger ^d	Lower jaw
<i>P. schaubi</i>	Probably lower Bridger ^e	Lower jaw

^a Lower Bridger = Black's Fork member, upper Bridger = Twin Buttes member of Wood, *et al.*, 1941.

^b This species probably belongs to a genus distinct from *Sciuravus*.

^c Wilson, 1938.

^d Dry Creek.

^e Twin Buttes, red stratum.

rather than the paracone and metacone found on P⁴ in other sciuravids. A ridge extends linguad from the anteromedial side of the paracone to the protocone. On the posterior flank of the paracone there is a worn area from which a second ridge extends to the protocone. The two ridges enclose a shallow basin. The valley between the posterior ridge and the posterior cingulum is divided into buccal and lingual parts by a worn area that connects ridge and cingulum. Anterior and posterior cingula are in contact with the protocone; a slight posterolingual convexity on the posterior cingulum may represent a hypocone. This structure of P⁴ could be primitive, representing a stage before the molarization of the tooth had progressed as far as the development of a metacone. An early Eocene paramyid from the lower Gray Bull (Wood and Patterson, 1959, p. 296; Wood, MS) has P⁴ in a level of development from which that in No. 12118 could have been derived without having gone through a stage with a metacone. In the absence of intermediates such a derivation cannot be proved, but the evidence is suggestive. If

No. 12118 were derived from a primitive paramyid lacking a metacone on P^4 , the question is raised of the origin of the metacone on P^4 in other sciuravids. Was a single buccal cusp on P^4 found in the ancestral sciuravid, with later development of a metacone in some sciuravid lines and the retention of the primitive premolar condition in a line represented by No. 12118? Did rodents recognized as sciuravids arise from different paramyid groups, one having a single buccal cusp on P^4 and another having paracone and metacone developed on that tooth? As yet earlier Eocene sciuravids do not answer these speculative questions.

Another alternative is that P^4 in No. 12118 is undergoing reduction. The worn area on the posterior flank of the paracone may represent a

TABLE 2
MEASUREMENTS (IN MILLIMETERS) OF A.M.N.H. No. 12118

	Anteroposterior	Transverse
P^3	1.2	1.1
P^4	1.5	2.1
M^1	1.9	2.1

reduced metacone. Evidence that may oppose this alternative is the relatively well-developed P^3 , which might be expected to be smaller if general premolar reduction were taking place.

Within the Bridger the premolar structure of No. 12118 separates it from sciuravids known by upper teeth, *Sciuravus* and *Taxymys* (see Wilson, 1938, figs. 1-2, 13-15). Differences from these genera are exhibited by M^1 also. In M^1 of No. 12118 the buccal part of the anterior cingulum is more distinctly raised into a parastyle, and the buccal side of the tooth is concave, rather than slightly convex. The paracone, mesostyle, and metacone are more ridged and less cuspsate than those of *Sciuravus*. In *Taxymys* protoloph and metaloph are more directly transverse in orientation.

Some later rodents have on P^4 a large buccal cusp somewhat similar to that in No. 12118. *Platypittamys*, a lower Oligocene South American octodontid, was described by Wood (1949, pp. 16-18) as having a primitive P^4 with "an undivided buccal amphicone." Other than having a large buccal cusp, however, P^4 in *Platypittamys* does not show much resemblance to that in No. 12118. The later interpretation by Wood and Patterson (1959, pp. 296-297) of *Platypittamys* as having widely separated buccal paracone and metacone on P^4 , rather than a

buccal "amphicone," further separates *Platypittamys* from No. 12118. *Tataromys* from the upper Oligocene of Mongolia (Matthew and Granger, 1923, pp. 5-6) has a large buccal cusp on P⁴. The similarity to No. 12118 is interesting, but it may be only superficial and is not necessarily indicative of relationship between No. 12118 and *Tataromys*. In both *Platypittamys* and *Tataromys* P³ is absent, and thus premolar reduction has progressed farther than in No. 12118. The pattern of P⁴ in *Platypittamys* and *Tataromys* may reflect reduction also. Such reduction of P⁴ has been suggested as possible for *Platypittamys* (Wood and Patterson, 1959, pp. 297-298) and is considered by Bohlin (1946, p. 131) to account for the structure of that tooth in *Tataromys*.

It is hoped that additional specimens will allow a more complete understanding of the morphology and taxonomic position of the rodent represented by A.M.N.H. No. 12118.

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